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THE FOOD PRODUCTS OF CANADA



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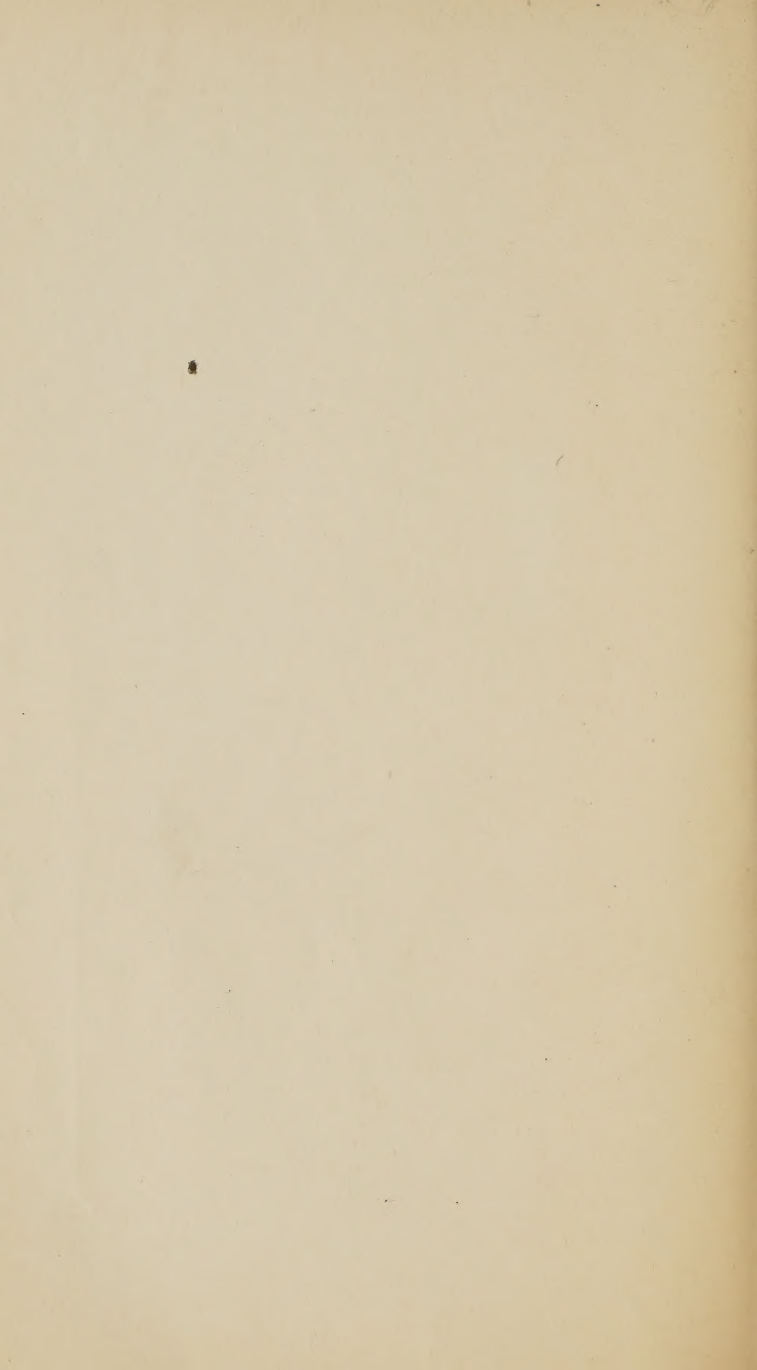


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THE
FOOD PRODUCTS
OF
CANADA

BY
JAS. W. ROBERTSON

COMMISSIONER OF AGRICULTURE AND
DAIRYING FOR THE DOMINION
OF CANADA.

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1900

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THE FOOD PRODUCTS OF CANADA.

BY

JAS. W. ROBERTSON,

*Commissioner of Agriculture and Dairying
for the Dominion of Canada.*

“Half the struggle of life is a struggle for food.” It is not necessarily a keen one in Canada, where food is abundant,—with plenty to spare for export to other countries. The chief objects for which food is consumed are (1) to sustain the heat and other forms of energy in the body, (2) to form the fluids and tissues during its growth, (3) to repair the wastes they undergo through the processes of vital activity, (4) sometimes to yield a product, and (5) to store up a reserve of materials and force for the functions of life. Sound health in well nourished bodies is the first essential of well-being in all countries and in all conditions of civilization and society; and it is greatly promoted by wholesome food in sufficient quantities and of suitable quality for the age, occupation and circumstances of each individual. The kind and quality of the foods which are consumed are closely identified with, if not the actual cause of progress or deterioration among a people.

Original Sources of Foods.

Plants are able to live on inorganic substances, and the simplest forms of them feed on the constituents of the atmosphere and water only. When they die and are

resolved into the original elements or compounds, these in turn become part of the food of higher forms of plant life. On the other hand, animals are not able to subsist upon inorganic materials alone ; they are dependent on the vegetable forms of life. Some of the higher forms of animal life consume products from the bodies of other animals which in turn had been nourished by plants of some sort. Grass grows by taking in some 13 elements from the soil and air : the wheat plant is a variety of grass and grows in the same way : a cow and ox eat grass or grain : and man drinks the milk of the one and eats the flesh of the other, with bread from the flour of the wheat.

Capacity of Canada for Production.

In Canada, the soil, the climate, and the intelligence and industry of the people are favorable for the production of a great variety of food products of exceptionally fine qualities from farms, gardens, orchards and vineyards ; and the extensive sea coasts, vast lakes, rivers and streams abound with the finest of fish. From its geographical position, its railway systems and unsurpassed steamship service for freight across the Atlantic, the export trade in food products can be greatly extended with European countries to the mutual benefit of Canada and the countries which purchase from her.

The production of foods is the main aim of farming operations : and over 45 per cent of the population of Canada are engaged in agricultural occupations. There are vast areas of fertile soil from the Atlantic to the Pacific oceans, and the climate or climates range from subtropical to subarctic, with a rainfall varying from 67 inches per annum in British Columbia, 17 inches in Manitoba, to from 30 to 45 inches in the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island. The mainland practically lies between 60° W. longitude and 125° W. longitude. The distance across Canada from East to West is rather more than one-

sixth of the distance around the earth at that latitude. It extends from a little South of 42° N. latitude to the arctic regions. France lies between 42° N. latitude and 51° N. latitude, which corresponds to the latitude of the settled portions of Canada. For instance Toronto lies in latitude $43^{\circ} 39'$ N., and Cannes, in the South of France, in latitude $43^{\circ} 34'$ N. Winnipeg, in the Province of Manitoba, lies in latitude $49^{\circ} 50'$ N., and Havre, on the North coast of France, in latitude $49^{\circ} 29'$ N. However the climate on the whole is warmer in summer and colder in winter than in corresponding latitudes in Europe.

Canada lies in latitudes similar to those of the great countries whose peoples are foremost in the world's affairs. It has a land surface nearly 29 times larger than Great Britain and Ireland, or 17 times larger than France. If the area of the whole of Europe be represented by 12, then the area of Canada would be 11. Of course large tracts in the northern arctic regions are uninhabitable and entirely useless for the production of foods; but across the continent, there is a zone about 3,500 miles long, and nearly as wide as France, with a climate adapted to the production of foods of a superior quality. Within that belt there are some mountainous regions and a few hundred miles of arid prairies, where the settlement will always be sparse and the production of foods scanty.

These comparisons indicate roughly the enormous capacity of Canada for the production of foods. In places which are now cultivated the soil has been found fertile. That of Manitoba is rich in the constituents of plant food to a degree that surpasses nearly all the soils of Europe. The freezing of the soil in winter, which at first sight seems a drawback, retains the soluble nitrates which might otherwise be drained out.

By competent authorities in England it has been estimated that the drainage in that country from November to March carries off to the sea a quantity of nitrates per acre sufficient for an average crop of wheat.

The Government and Co-operation.

In Canada the intelligence of the individual farmer is supplemented by direction and guidance from governmental sources, through the Departments of Agriculture of the Federal and various Provincial Governments. While certain parts of farm work and business can be conducted with the greatest success by the individual, as independently of his fellow citizens as any one can act in a civilized community, part of the management of agriculture and the production of foods can be conducted with most advantage through some form of co operation. In several branches of their work farmers have formed co-operative associations. The ability of the individual farmer has been enlarged and strengthened by the union of effort. This has been the case particularly in dairying work.

The following quotation from a former report of the Commissioner of Agriculture, indicates how the production of foods, with intelligence, skill and co-operation, goes hand in hand with the well-being of the State.

The Path of Progress.

"There have been many and great changes in the method of agriculture during recent years. It has grown to mean more than the cultivation of land. In its primitive state, the practice was to disturb the bosom of mother earth, plant seeds, reap, and eat the crop. Muscular strength was its mainstay, and the constant exercise of rigorous self-denial its almost only economy.

"Now, agriculture may be said to include not only the cultivation of the land but the culture of the people who live on the land. As Canada is essentially an agricultural country, most of its wealth must come first from its farms. Wealth may be defined as anything that ministers to the wants and happiness of man and the ownership and possession of which can be transferred from one person to another. Its original sources are the sun, soil, air, water, plants, animals and labour. It is the task of the agriculturist to so manage these agents and agencies as to obtain the largest and best service for himself and his fellows from them.

“His effort must be directed by intelligent purpose, if he is to prove successful in his avocation. The outcome of true culture is the exercise of intelligent purpose in the activities of life; and that in his occupation stamps the good farmer as a man of real culture. It is a false and mischievous notion which imagines that culture consists in or is shown by a life of idleness in the midst of beautiful and luxurious surroundings. That is not culture; it is corrosion of the fibres of muscular, mental and moral life. In all countries and ages culture has followed wealth—and then forsaken those who lived only selfishly to enjoy it.

“Moral courage and intellectual enjoyments rest upon and rise from the basis of a people like Canadians who are well-fed and well-clothed, who live in comfortable houses, and who keep themselves perfectly clean.”

Different Sorts of Foods.

Experience has taught intelligent people what sorts of foods are suitable for maintaining the body in health, strength and comfort. At the same time ignorance concerning the relative nourishing properties of foods, bad cooking, excessive eating, and the adulterations of dishonest manufacturers and merchants in some countries, are causes to some extent of ill-health and poverty.

The foods in general use throughout Europe and the Continent of North America are various in character:—Leaves are eaten, as in cabbages and lettuce; stems of plants, as in asparagus and rhubarb; roots of plants, as in carrots and beets; underground tubers, as in potatoes; the fruits of plants, as in tomatoes, apples, and strawberries; the pods of plants, as in string beans; the seeds of plants, as in peas; preparations from the seeds of cereals, as in flour and oatmeal; the products of living animals, in eggs, milk and derivatives of milk, such as cheese, butter and cream; the flesh of animals, as in poultry, beef, veal, mutton, lamb and pork; and fish of all sorts, from streams, rivers, fresh water lakes and the sea.

The facilities for communication and commercial intercourse have created new wants in diets, and have

provided means for meeting them with products gathered from all quarters of the world. On the one breakfast table, one finds oranges from Florida and apples from Canada; bread from wheat grown in Manitoba, with butter from the Province of Quebec; tea from India or Ceylon, and coffee from Jamaica; oatmeal and beefsteak from Ontario; salmon from the rivers of British Columbia or New Brunswick; eggs and potatoes from Nova Scotia; and lamb chops, cheese and jams from Ontario, Quebec and Prince Edward Island.

Improvement of the means for preserving perishable food products, notably by cold storage, and modern transportation by railways and steamships, have made the whole world one great market. From every quarter supplies can be drawn to meet the wants or tastes of those who are willing and able to pay the cost; and taking into account quality and nourishing properties, Canada is in a position to offer the very best value to countries which need to import food products.

Breadstuffs.

All the world knows that Canadian grown wheat yields flour the finest for bread-making that is to be found anywhere. The oats and oatmeal of Canada are unsurpassed in substance and flavour; and the peas, beans and rye are second to none. Wheat, flour, oatmeal and peas have already found their way into distant markets in a condition almost as good as when they left the granary and the mill.

Of **Wheat** many varieties are grown in Canada. The soil and climate are adapted to bring the crop to perfection. The methods of cultivation do not involve the application of so much hand labour per acre as in Europe. The average yield of spring wheat in the province of Manitoba for 1899 was 17·13 bushels per acre. The average yield of fall or winter wheat in the province of Ontario for the last seventeen years, has been 20 bushels per acre. As a rule, the weather during

the harvesting period permits the grain to be gathered safely without any damage from sprouting. Suitable machinery for cleaning the grain is everywhere in general use, so that weed seeds are removed before the wheat is ground. That gives Canadian wheat excellent milling properties, and enables the millers to turn out flour uniform in quality and of high grade as to keeping properties.

Canadian Flour has been steadily gaining ground in the European markets, and is becoming known as flour from which bakers can make not only the best quality of bread, but also the largest quantity per barrel. In Great Britain the bakers do not know Canadian flour as such in hardly any case, but where they do know it they speak exceedingly highly of it as a strong flour, good for mixing with other flours and giving good bread. The English bakers make up their sponge from seven or eight brands of flour, so as to have a continuity of quality in case one brand should fail them in the market. I got a sample of the best Hungarian flour, brought from Hungary by a gentleman in the milling business who was passing through that country. It was examined by the best experts. Analyses established the fact that the quantity of albuminoids (flesh forming principles) was one-tenth greater in Canadian flour than in the best brand of Hungarian. I went to a prominent baker in London to see if there was any possibility of having a test made by using Canadian flour in one of the modern bakeries. The test was made by the bakers themselves for their own information. This reliable firm of bakers furnished me with a report afterwards. One of their tests in using Canadian flour gave the rate of 146 pounds of bread from 100 pounds of flour, and that of excellent quality. They got at the rate of 152 pounds of bread from the next, and 151 pounds from a third test. All of these were from strong Canadian flour. There is no other flour going to England from any country, so far as I can learn, that makes as much bread per 100 pounds, or as good bread as Canadian flour.

Canadian flour not only contains an exceptionally large percentage of albuminoids, but the different forms of gluten are present in such a condition as to give the dough great tenacity and capacity to take up water. Such a thing as adulteration of Canadian flour by Indian corn flour, or other cheaper and inferior substances, is entirely unknown.

The flour milling interest in Canada is a very important one. There are not less than 2,500 mills, employing over 6,000 men. The values of the wheat and flour exported from Canada in the years 1898 and 1899, are shown in the following table :—

	1898	1899
Wheat exported	\$17,313,916	\$7,784,487
Flour “ 	5,425,760	3,105,288

There is room for a great extension in the cultivation of wheat and the manufacture and exportation of flour. By the growing of crops of clover alternately with wheat, one main constituent—nitrogen—required in the soil to keep it fertile, may be renewed perpetually. The general use of labour-saving machinery in the cultivation of wheat and in the manufacture of flour, and the availability of great water powers, all favour extension in this branch of the production of foods.

Oats of fine quality are grown in large crops, from Prince Edward Island, on the Atlantic coast to Vancouver on the Pacific coast. With the soil and climate admirably adapted for producing oats of heavy weight per bushel, with thin husk, it seems that Canada will have a larger share of the trade of Europe in oatmeal.

Oatmeal from Canada is equal in quality to the best, not even excepting the renowned oatmeal which forms the national dish of the Scottish people. It is prepared in different forms, and in various degrees of fineness; also as rolled oats, and oat flakes. As a rule, the weather is favourable for both the growth and harvesting of the crop. Consequently, oats and oatmeal do not become bitter from sprouted grain, or musty

from the heating of the straw in stacks, as is sometimes the case in countries where harvest weather is often wet.

Peas in large areas are grown free from serious trouble with insect pests. Split peas for soup, green peas as vegetables and sweet peas for canning, are obtained in perfection. The values of the peas exported in 1898 and 1899 were as follows :—

	1898	1899
Peas exported.....	\$1,813,792	\$1,955,598

Barley was formerly grown in enormous quantities for export to the United States for the making of beer ; and some varieties are cultivated with success for the making of pearl or pot barley.

Rye is cultivated successfully throughout Canada, but is seldom used as food by the people. Flour from wheat and meal from oats and meal from Indian corn are preferred.

Buckwheat flour is used in considerable quantities in some districts for the making of buckwheat cakes, eaten with maple syrup. These two make an exquisite breakfast dish, characteristic of Canada and some of the New England States.

There are numerous forms of preparations from cereals, sold as breakfast foods. Owing to the superiority of the grains grown in Canada and the care exercised in their manufacture, these compare favourably with similar products in other countries.

Vegetable Foods.

Vegetables are grown everywhere, and form a large part of the diet of the people. However, there is a comparatively small export trade in them, except in the case of potatoes and vegetables which have been canned or dried.

Among other vegetables besides potatoes, which thrive well and yield large quantities of excellent quality, are turnips, carrots, parsnips and beets. Among the common vegetables used in the green state, are peas, beans, cabbage, cauliflowers, asparagus, Indian corn, onions, leeks, tomatoes, lettuce, radish, celery, parsley, cucumbers, pumpkins, squash and rhubarb.

Animal Products.

Canada has a climate and a soil admirably adapted for growing large quantities per acre of such plants as are suitable for the cheap production of cattle products of fine quality. No country is superior to Canada as a home for cattle, swine, poultry and sheep. The bracing weather of Canadian winters is followed by the warmth and humidity of genial summers, under which crops grow in almost tropical luxuriance. At the same time, the cool evenings and nights give the plants a robustness of quality which are not to be found in tropical regions, and also make life for the various domestic animals wholesome and comfortable.

In the Northwest Territories of Canada, there are vast areas of prairie land, over which cattle pasture, and from which thousands of fat bullocks are shipped annually. Throughout other parts of Canada, bullocks are fed on pasture land and also in stables, on nourishing and succulent feed, such as hay, Indian corn fodder, Indian corn ensilage, turnips, carrots, mangels, ground oats, barley, peas, Indian corn, rye, bran, and linseed oil cake.

The Breeding of Cattle, adapted for the production of beef, has received much attention for many years. The aim is to have cattle of such forms of body, that the beef will be grown on these places where the most valuable cuts are found. There is government control of the spaces on the steamships in which the cattle are carried, and veterinary inspection to prevent the exportation of any animals that

might be affected with disease. The values of live cattle exported from Canada during the years of 1898 and 1899, were as follows (all years ending 30th June):—

	1898.	1899.
Cattle exported.....	\$8,723,292	\$8,522,835

In recent years a trade has been growing up in the exportation of dressed beef in cold storage, and also in the exportation of beef preserved in hermetically sealed tins.

Sheep thrive well on the hill pastures of Canada, and mutton and lamb of fine flavour are plentiful. In addition to supplying the local markets of the country, sheep and lambs were exported from Canada during the years 1898 and 1899 to the following values:—

	1898.	1899.
Sheep and lambs exported.....	\$1,272,077	\$1,540,857

Swine are reared and fattened in Canada in large numbers. The growth of the export trade in bacon is shown by the following table:—

Bacon, hams and pork exported,—

1896	1897.	1898.	1899.
\$ 4,446,884	\$ 5,871,988	\$ 8,092,930	\$ 10,473,211

Canadian hogs are fed, as a rule, in a cleanly way. They are fed on feeds suited for the production of what are known as fleshy sides. Bacon with an excess of fat is not wanted except in the lumber camps. Consequently the farmers of Canada have been going into the breeding and rearing of a class of swine suited for the production of bacon having plenty of lean and firm flesh. The great extension of the dairy business of Canada has fitted in with the rearing of large numbers of swine. Skim-milk and whey are feeds suited for the feeding of swine. Experimental work has shown that swine fattened with part of a ration of skim-milk, were lustier, more vigorous and of a more healthy appearance than swine fatted wholly on a ration of grain. Whey is also a valuable feed for swine. There are about seven pounds of solids in every hundred pounds, and that quantity of

whely fed properly in combination with other feeds, has produced two pounds of increase in the live-weight of swine. The feeding of meals from a mixture of cereals, such as oats, barley, peas, rye, and Indian corn, has resulted in a fine quality of swine products at the least cost per pound of production.

The slaughtering and curing of swine products is carried on chiefly at large packing houses. The equipment, skill of the workmen and commercial talent of the managers, have resulted in the turning out of bacon and hams of exceptionally fine, mild quality. The use of mechanical refrigerating plants for chilling the pork, and in other connections, have made it practicable to cure the bacon with the use of a small percentage of salt, leaving it mild in flavour when delivered in European markets. The business is now carried on in such a way that regular supplies are shipped from Canada during every week of the whole year.

As by-products from the packing houses, large quantities of lard, brawn and pigs' feet are exported; and there is a growing trade in dainty and exquisite food put up in hermetically sealed tins under the name of lunch tongues.

Poultry.

Turkeys thrive well in Canada, grow to a fine size, and have flesh of tender quality. Chickens are raised in large numbers, and of late years, farmers are adopting the method of fattening them a few weeks before they are killed. That increases the quantity and proportion of edible material on each bird. Quantities of turkeys and fattened chickens are now available for export to other countries, and there is room for very great extension.

Eggs.

Canadian Eggs were exported in 1898 and 1899 to the value of :—

	1898.	1899.
Eggs exported	\$1,255,304	\$1,267,063

The eggs for export are usually packed in cases containing 30 dozens each. Cardboard fillers are used which provide a separate compartment for each egg. In size, quality and strength of shell, they are finding great favour with the European importers who handle them. There are cold storage warehouses at various points in Canada, at which the eggs are collected, sorted and packed before shipment. These permit the eggs to be landed in Europe in a practically fresh condition as to flavour, with the shells quite full.

Dairy Products.

Canada has been called the land of milk and honey. Milk is plentiful and enters largely into the diet of the people. The healthy condition of the cows, the pure air of the country, and the cleanly habits of the people ensure the wholesome quality of the milk which is generally supplied. There is no export trade in milk, but large quantities are now put up in hermetically sealed tins, as condensed milk, for use in mining camps and on board steamships, where supplies of fresh milk cannot be obtained.

The Cheese manufactured in Canada is chiefly of a variety known as Canadian Cheddar cheese. The word Cheddar, while originally designating cheese made at the village and parish of Cheddar, in Somersetshire, England, has for the past century been applied to the method of making cheese rather than to the locality where it may be made. It is essentially a food cheese rather than a tasty or appetizing condiment such as is eaten in other countries with pastry or after-dinner dishes. Compared with beef, it is so nutritious, that one pound of it will furnish as much nourishing material as $2\frac{1}{2}$ pounds of the best beefsteak. It is easily digestible when properly cured. It is manufactured in factories by skilled labour; the milk, the curd and the cheese are handled in a cleanly manner, with very little contact with the hands

of the operatives. The nasty and decayed flavours common to some of the soft cheeses of Europe, are quite foreign to Canadian cheese. Cheeses which have a bad smell are only cheeses in an advanced stage of decomposition. As food to nourish the body, sustain life and supply energy for labour, those are not at all comparable with the clean, sweet smelling cheeses, of rich body, such as are shipped from Canada.

Canadian Cheddar cheese has a composition which usually shows 34 per cent of water, 33 per cent of fat and 27 per cent of casein. It has practically the same composition as the finest Roquefort cheese, is richer in fat than the Camembert, and richer in fat and also in casein than the Brie.

The following table shows the growth of the export trade in cheese from Canada :—

	1880	1890	1899
Cheese exported,	\$3,893,366	\$9,372,212	\$16,776,765

The industry is largely carried on by co-operative associations of farmers. The number of cheese factories and creameries has grown from 1733 in the year 1891 to 3649 in the year 1899.

Butter for export from Canada is now made in creameries where the milk, cream and butter are handled by skilled makers. A thimbleful of milk of average quality contains over ten millions of globules of butter fat. They are lighter than the liquid or serum of the milk in which they float, and when it is left at rest, they rise to the top. Cream is only that part of the milk into which the globules of fat are gathered in larger numbers than they are in the whole milk. It has no constant, regular percentage of butter fat. There may be only 8 pounds, or there may be 75 pounds of butter fat in 100 pounds of cream. Two methods for separating the cream from milk are in common use. One is known as the natural, or setting method, by which the milk is left at rest until the globules of fat rise to the surface. The other is known as the mechanical or centrifugal method,

by which the cream and the skim-milk are separated through the application of mechanical force. The machine which is used for that purpose is called a centrifugal cream separator. In the process of manufacturing butter, the cream is ripened, then churned, by means of which the globules of fat are gathered into a mass. When that has been properly pressed, salted and packed, it is the butter of commerce. Butter is injured if exposed to a warm temperature or to any disagreeable odors. The creameries of Canada are provided with special cold storage rooms into which the butter is placed the same day on which it is made. From them it may be carried in refrigerator railway cars and in cold storage chambers on steamships to its ultimate destination. For the export trade it is packed in square boxes made of spruce or some other odorless wood. These are lined with parchment paper and contain each 56 pounds net of butter. The growth of the export trade of butter since the cold storage facilities for the safe carriage were arranged for by the Government of Canada, is shown in the following table :—

Butter exported :—

Year.	Value.	Year.	Value.
1895.....	\$ 697,476	1898.....	\$2,046,686
1896... ..	1,052,089	1899.....	3,700,873
1897.....	2,089,173		

Fruits.

In all the settled districts of Canada lying eastward of the Great Lakes and westward of the Rocky Mountains, apples of the finest quality in flavour, in substance, in colour and in size, can be grown ; and in areas containing hundreds of square miles pears, peaches and grapes are grown in quantities in the open air. The climate is favourable to the growth of small fruits such as plums, cherries, strawberries, raspberries, currants, gooseberries, and there are great areas in which cranberries, blackberries and blueberries grow plentifully.

Apples and Pears are the chief sorts of fruit exported from Canada. The high flavour, the crisp, juicy flesh and the long keeping qualities of the Canadian apples are their chief merits. As indicating how apples may be preserved in undeteriorated condition by cold storage, the comparatively tender, but very dainty and high flavoured Fameuse, will be the evidence in the cold storage case at the Paris Exposition during the summer. All the other leading varieties will also be exhibited.

Apples are exported from Canada in barrels, and also in boxes containing about one bushel each.

In addition to the apples which are shipped in their natural or fresh condition, large quantities are evaporated and exported. Large quantities of them and of other sorts of fruits are also put up in hermetically sealed tins. An increasing trade in these is being developed between Canada and Europe.

Honey and Maple Sugar.

Honey may be named as one of the minor food products of Canada. With clover blossoms perfuming the air for hundreds of miles, honey bees have plenty of pasturage. It is everywhere admitted that Canadian honey, for colour, flavour and substance, is unsurpassed. The exhibit of honey in Paris in extracted form, and also in the comb, illustrates the delightful summer climate of the country. It is an exhibit of the flowers, fragrance and sunshine of Canada condensed and compressed into sweetness.

Maple Sugar and Syrup are made in those areas of the country where the maple tree flourishes. The syrup is used chiefly as a substitute for jams or preserved fruits, and the sugar is used in country homes for sweetening, for cooking purposes and for the making of confectionery. During recent years the processes of manufacture have been improved by the introduction of specially constructed evaporators, and quantities of maple sugar and syrup are now available for the export trade.

Beverages.

Light Wines of good body and and flavour are made from grapes grown in the open air in large quantities, particularly in the southern part of Ontario, and the manufacturers now claim that they compare very favourably with wines of similar age manufactured elsewhere. Frequently the grapes are sold to the wine makers at prices from \$15 to \$20 per ton of 2,000 pounds.

The manufacture of beer, ales and porter is carried on extensively. Barley and hops are grown plentifully in many parts of Canada. These beverages in Canada are recognized as being pure and of a quality which compares most favourably with those of other countries.

Whisky and brandy are manufactured at distilleries; and a trade of large proportions has grown up of recent years in the exportation of Canadian whisky.

Natural Springs in Canada provide many table waters of a composition and quality quite similar to the waters of the famed watering places in different parts of Europe. Some are saline, some potassic and some sulphurous in their main characteristics. Several of them are preferred to the table waters from the continent of Europe.

Aerated waters, soda waters, ginger ale and beverages of that sort are put up of excellent quality and are consumed extensively in Canada.

Fish Products.

The coasts of Canada on both the Atlantic and Pacific sides are fishing grounds of great value. The arctic currents which flow southward bear with them great areas of water filled with the remains of insect life. For more than three centuries, fishermen from the American and European continents have been engaged in fishing in these waters, without any evidence of diminution of the quantity which is still available. In fact, the taking out of so many fish by the fishermen seems to have no apparent effect on the myriads which annually frequent these haunts.

As a separate pamphlet has been issued regarding the fisheries of Canada, it will suffice here to mention only the names of some of the species of fish which are the most important in the commerce of food products of fish origin.

Codfish, in a fresh condition or in a salted and dried state, are handled in enormous quantities. In 1899, the Dominion Government arranged to assist the fishermen to form fishermen's bait associations, and to preserve bait in a frozen condition for use in the summer months. In former years fishermen have been idle during part of the best fishing period of the year from want of bait. An available supply of bait during the whole of the summer will doubtless lead to a great increase in the quantity of cod caught on the Atlantic coast.

Salmon are caught in large quantities on both the Atlantic and the Pacific coasts. On the rivers of the Pacific coast particularly, the salmon catching and the salmon canning have become very large industries. The values of the canned salmon exported from Canada in 1898 and 1899 are shown on the following table :—

	1898	1899
Canned salmon exported.....	\$ 3,430,645	\$ 2,407,481

The salmon caught on the Atlantic coast is of particularly delicate flavour and will doubtless be in the near future shipped to European countries in large quantities, in a fresh condition, by means of cold storage.

Canadian Lobsters are put up in large quantities on the coasts of Quebec and of the three maritime provinces.

	1898	1899
Lobsters exported.....	\$ 2,290,872	\$ 2,320,060

There are large industries in the catching and curing of herrings, mackerels, sardines and haddocks. Quantities of these also are sold in a fresh condition for food.

Whitefish are caught in large quantities in the great lakes of Ontario, Erie, Huron and Superior, Manitoba, Winnipeg and Winnipegosis. This fish has a particularly small quantity of offal for the size of its body. Its small head and mouth point to it as a model fish for food; and the firm, white flesh and dainty flavour confirm that exterior indication. Trout and sturgeon are found in the rivers and lakes.

In brief, the coast, lake, river and stream fisheries of Canada are much the largest in the world in point of area, abundance and quality of fish. With all the improved facilities for catching, the supply appears to be well nigh inexhaustible.

Transportation Problems.

The difficulties in shipping perishable food products to Europe have been the long distance, deterioration in transit and the cost of freight. As a rule the transportation charges have been reasonable. The freight charges from points in Canada to Great Britain on fine food products are a very small proportion of their value to the farmers here. As a rule the actual freight charges on cheese shipped from Ontario and Quebec, between the shipping station nearest to the factory and the ports

of London, Bristol, Liverpool or Glasgow, do not exceed five or six per cent. of the value of the cheese as sold at the factory. The average freight charges on creamery butter, with cold storage, as a rule do not exceed four per cent. of the value of the product. These figures refer to transportation charges only and not to any charges for insurance or commission in selling.

Transportation on railways and on steamships in and from Canada are such as to permit of a reasonably cheap, safe and speedy carriage of food products from the places of their production to their ultimate markets. There is also plenty of warehouse accommodation for the safe storage, either as part of their transportation or while being accumulated at any centre.

Cold Storage.

The Government of Canada arranged for a complete chain of cold storage service between various points in Canada and markets in Europe, particularly in Great Britain. The Government offered a bonus to the owners of creameries who would provide cold storage accommodation at them and keep the room in use for a period of three years. They also arranged with the various railway companies to run refrigerator cars weekly on the main lines leading to Montreal and other export points. The food products from any shippers are received into these cars at the various railway stations at the usual rates, without any extra charge for the icing or cold storage service. The Government also offered subventions to those who would provide cold storage warehouses at various points where these were necessary. The Government also arranged with the owners of some thirty-three ocean steamships to provide cold storage chambers on them by means of mechanical refrigerators.

These arrangements made by the Government have brought about a very great increase in the export trade, particularly in butter.

The following table shows the growth of the butter trade from the port of Montreal. It also shows how the growth has been coincident with the improvement and extension of cold storage :

**Butter Shipped from Montreal during period
of Navigation.**

	Total Packages.	
1894.....	32,055	No cold storage.
1895.....	65,664	{ Ice cold storage on steamships; and refrigerator car service on railways.
1896.....	157,321	Same as in 1895.
1897.....	220,200	{ Mechanical refrigeration on steam- ships; refrigerator car service on railways; bonus to cold storage at creameries.
1898.....	278,922	Extension of above.
1899.....	451,050	Extension of above.

The Uses of Cold Storage.

The chief uses of cold storage in agriculture and commerce are :—

- (1.) To preserve products.
- (2.) To prolong the marketing season and the period of consumption.
- (3.) To give the owner some chance to choose a time for selling.

But its main and comprehensive use is to keep products in their best condition on their way from the places where they were produced to the places where they are to be delivered to the ultimate consumer. And as a rule the sooner they are delivered to the consumer after they are ready for use, the better will be the results to all concerned.

Value Depends Upon Condition.

Every food commodity may be said to have two values, or to acquire its value from two different sources. The exchange value, according to which it can be exchanged at a certain rate for other things, will depend in a large measure upon its scarcity relative to the demand which exists for it. The exchange value, or range of market price, is affected and settled by many causes and circumstances. That part of the question is not touched by cold storage, except in so far as cold storage will conserve the quality of the food product, and thus give it a higher intrinsic value.

The intrinsic or food value of the commodity does not fluctuate greatly. A given quantity of wheat of a standard grade when in the same condition is always practically of the same food value. It can nourish a certain number of people for a certain length of time. The intrinsic food value of a pound of butter does not change except in so far as its condition changes. The exchange value or market price may fluctuate greatly, independently of the condition of the butter. But when the condition of the butter becomes bad, its food value and its relative market value are greatly reduced. The same is applicable to all perishable food products, such as butter, meats, cheese, eggs and fruits. The market value of nearly all these things is determined by the fineness of their flavour, the richness of their body and the niceness of their appearance. The composition does not so much determine the value as the condition, the flavour, the color and the general appearance. The excellence of the original quality of Canadian food products can now be preserved until they are delivered in the markets of Europe.



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